conferenceseries.com

International Congress on PEDIATRICS AND NEONATOLOGY

December 04-05, 2023 | Rome, Italy

Genetics of sexually dimorphic adipose distribution in humans

Grace T. Hansen
University of Chicago, USA

Abdominal obesity is associated with higher rates of morbidity and mortality from cardiovascular disease and type 2 diabetes than can be explained by obesity alone, and can be measured as waist-to-hip ratio adjusted for body mass index (WHRadjBMI). In this work, we identified genes associated with obesity and WHRadjBMI. To understand the effects of non-coding genetic variants that regulate these genes, we identified neighboring allele-sensitive enhancers that are predicted to regulate WHRadjBMI genes in women. Interestingly, we found that several of these waist-to-hip ratio-associated variants map within primate-specific Alu retrotransposons. The Alu retrotransposons associated with female WHRadjBMi harbor a DNA motif associated with adipocyte differentiation. This suggests that the evoluton of adipose distribution, like the evolution of other human traits, may have involved co-option of retrotransposons as gene expression modulators. To further understand the role of these genes in female fat distribution, we evaluated the role of the strongest female WHRadjBMI-associated gene, SNX10. We determined that SNX10 is required for human adipocyte differentiation. We found that a female WHRadjBMI-associated variant near SNX10 affects lipid traits in human adipocyte development.

Finally, we found that SNX10 is required for diet-induced adipose expansion in female mice, but not males, suggesting that this gene may play an important role in metabolism in female hormonal contexts, but not male. In summary, our data identify genes and gene regulatory mechanisms that moderate female-specific adipose distribution and may mediate metabolic dysfunction in women.

Biography

Grace Hansen is an MD/PhD student at the Pritzker School of Medicine at the University of Chicago. She completed her PhD in 2021 in the laboratory of Marcelo Nobrega, MD, PhD, with a focus on the gene regulation of complex disease. She is interested in how non-coding genetic variants regulate genes to create polygenic human diseases, and specifically in the genetics of neuropsychiatric disorders. Outside of the lab and medical school, she enjoys biking, knitting, and urban gardening.